



# Aeronautical Data Link Road Map, *An Air Carrier Perspective*

NASA ICNS Conference 2005

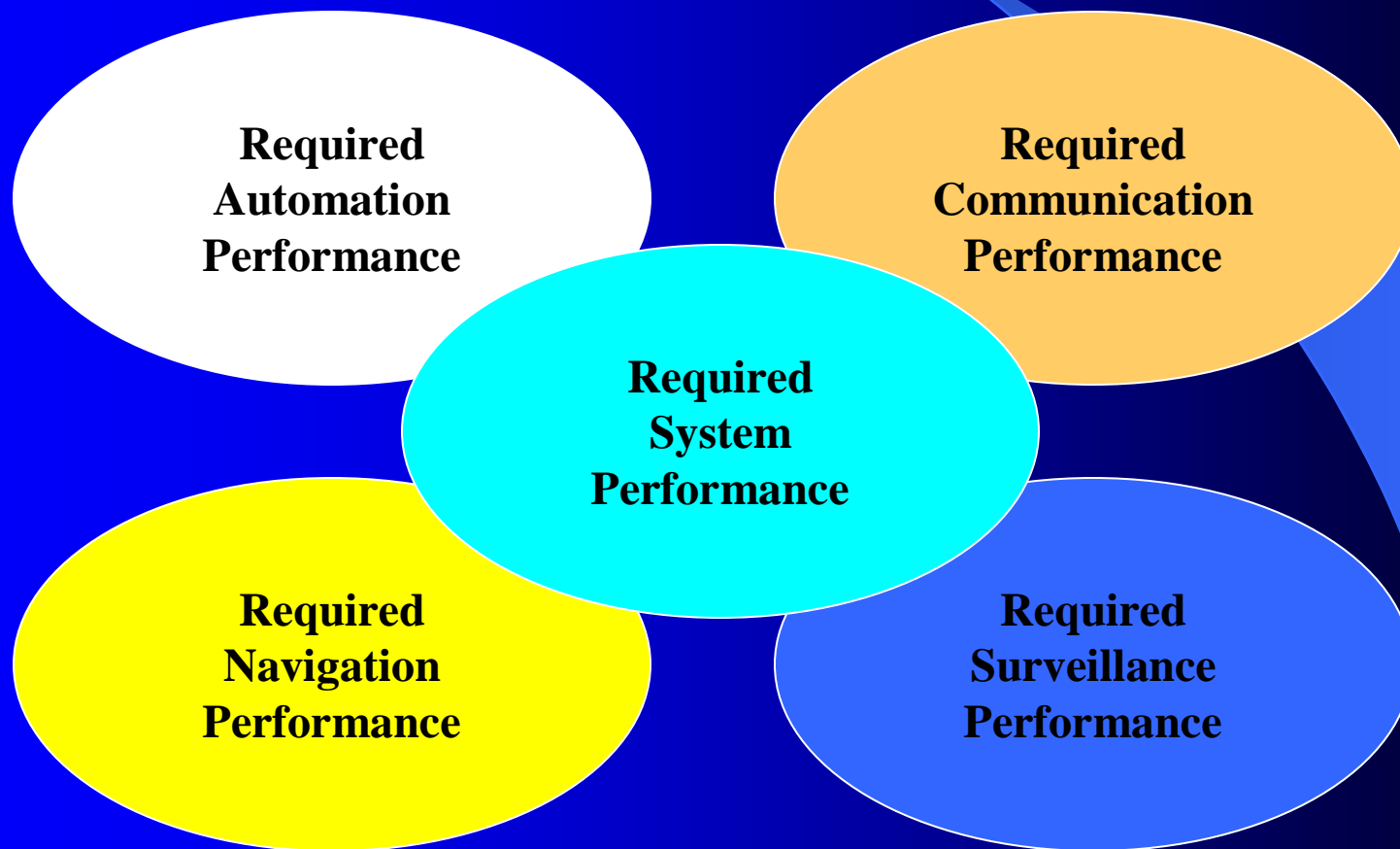
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ATN Systems, Inc.

# Overview

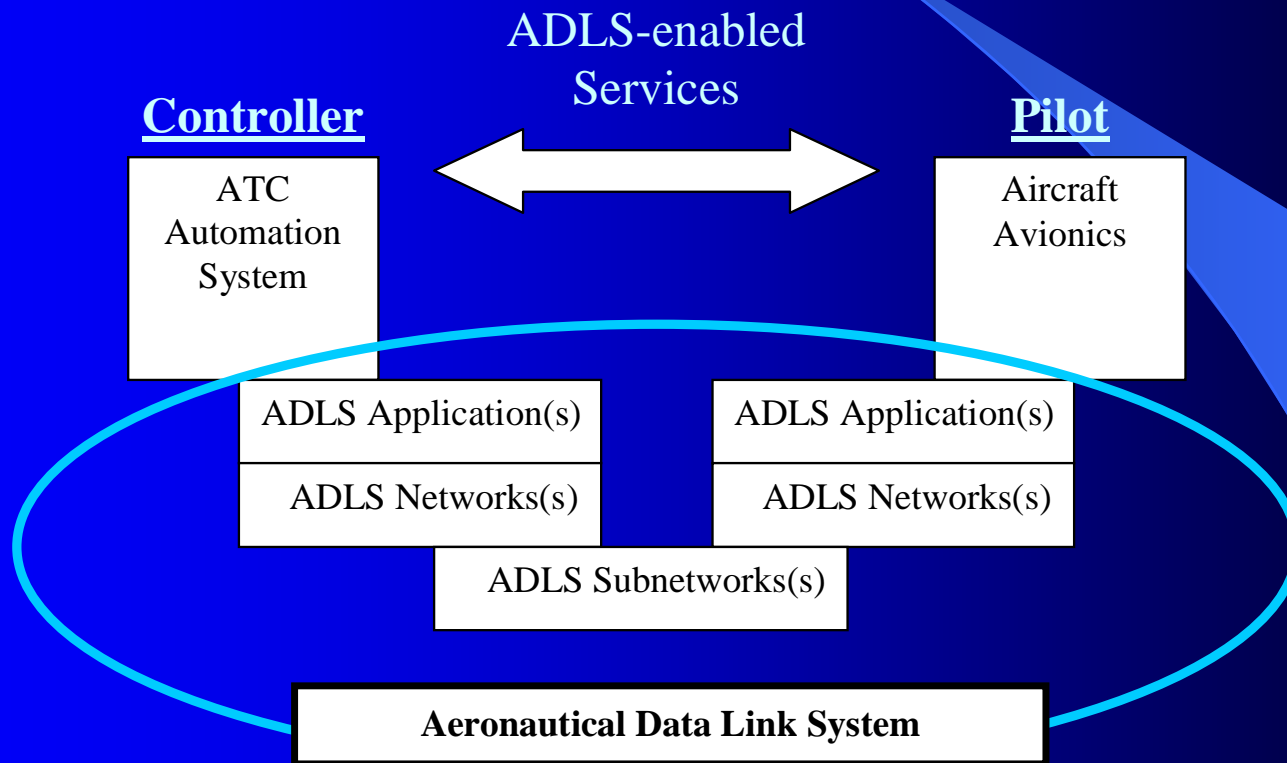
- Performance-Based, Integrated-CNS
- Aeronautical Data Link System (ADLS)
- FAA ADLS Road Map Related Activities
- Informal Air Carrier ADLS Road Map

# Integrated – CNS ATM

(Performance-Based Operational Capability)

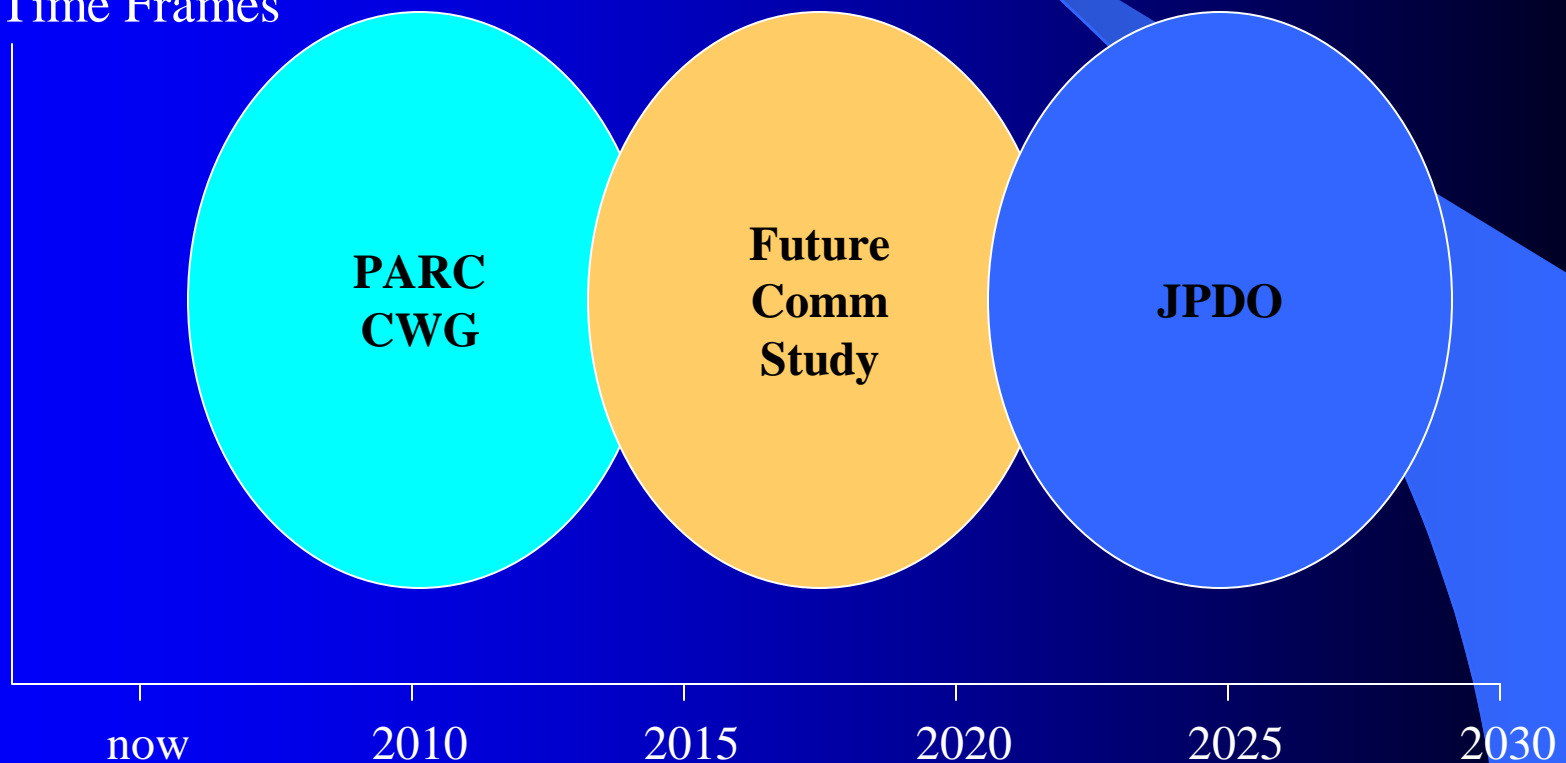


# ADLS: What is it?



# FAA ADLS Road Map (Related Activities)

ADLS Road Map  
Target Time Frames



# ADLS Program Coordination Group (PCG) Participants

- Air Carriers
  - American Airlines
  - Continental Airlines
  - Delta Air Lines
  - Federal Express
  - Northwest Airlines
  - Southwest Airlines
  - United Airlines
  - United Parcel Service
- Air Carrier Groups
  - Airline Pilots Association
  - Air Transport Association
  - Int'l Air Transport Association
- Industry
  - Adacel
  - Airbus
  - ARINC
  - ATNSI
  - Boeing
  - Computer Sciences Corp.
  - Honeywell
  - Lockheed Martin
  - SITA
  - Thales
- Government
  - Department of Defense
  - MITRE CAASD
  - NASA Glenn

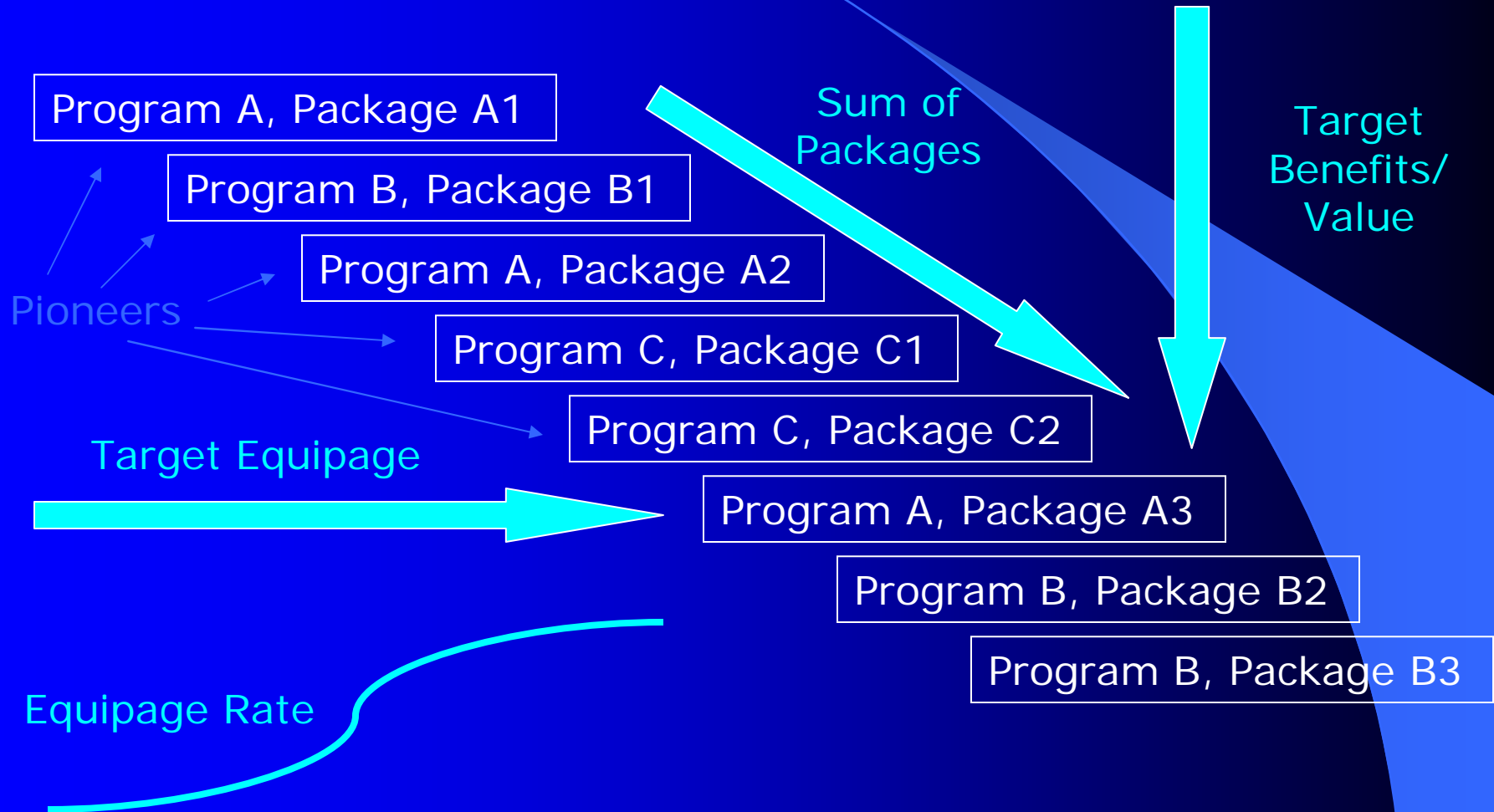
# ADLS PCG Assumptions

- ADLS is a key enabler for the NAS to accommodate expected increases in air traffic
- ADLS implementation must be “value-driven” not “technology-driven”
- Objectives must be focused to harmonize with related international ADLS programs
- ADLS is only a part of the larger CNS NAS infrastructure which must be implemented

# ADLS-enabled Service Package Criteria

- Service Package Definition
  - Required Communication Performance (RCP)
- Supporting Architecture
  - RCP Allocation (System, Application, Network, Subnetwork)
  - Other System Requirements (RAP, RNP, RSP, etc.)
- Economic Assessment
  - (For all Vested Parties)
- Stakeholder Commitments
  - (For all Vested Parties)
- Service Package Metrics
  - Safety/Operations/Performance/Value

# Service Package Phasing



# ADLS-enabled Services

## (examples)

Example ADLS-enabled Services

	<b>ATC Voice-Equivalent Services</b>	<b>ATC Automation Support Services</b>	<b>ATM Decision Support Services</b>
<i>Oceanic Domain</i>	<ul style="list-style-type: none"> <li>• Transfer of Comm</li> <li>• Strategic Clearances</li> <li>• Pass/Climb/Offset</li> </ul>	<ul style="list-style-type: none"> <li>• Dynamic Re-Route</li> <li>• Downstream Clearance</li> <li>• 30/30 Separation</li> </ul>	<ul style="list-style-type: none"> <li>• Advanced Dynamic Re-Route</li> <li>• Conformance Monitoring</li> <li>• Intent Information</li> <li>• Graphical Flt Information</li> </ul>
<i>En Route Domain</i>	<ul style="list-style-type: none"> <li>• Transfer of Comm</li> <li>• Strategic Clearances</li> <li>• Advisories</li> </ul>	<ul style="list-style-type: none"> <li>• Traffic Management Advisory</li> <li>• Tailored Arrival</li> <li>• Out-of-Sector Clearance</li> </ul>	<ul style="list-style-type: none"> <li>• Advanced Dynamic Re-Route</li> <li>• Conformance Monitoring</li> <li>• Intent Information</li> <li>• Graphical Flt Information</li> </ul>
<i>Terminal Domain</i>		<ul style="list-style-type: none"> <li>• Tailored Approach</li> <li>• Tailored Departure</li> </ul>	<ul style="list-style-type: none"> <li>• Advanced Dynamic Re-Route</li> <li>• Conformance Monitoring</li> <li>• Intent Information</li> <li>• Graphical Flt Information</li> </ul>
<i>Tower/Surface Domain</i>	<ul style="list-style-type: none"> <li>• PDC</li> <li>• D-ATIS</li> </ul>	<ul style="list-style-type: none"> <li>• Enhanced PDC</li> <li>• Taxi Clearances</li> <li>• Surface Movement</li> <li>• Airport Information</li> </ul>	<ul style="list-style-type: none"> <li>• Conformance Monitoring</li> <li>• Intent Information</li> <li>• Graphical Flt Information</li> </ul>
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Improved Safety</li> <li>• Improved Efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Improved Safety</li> <li>• Improved Efficiency</li> <li>• Increased Capacity</li> <li>• Lower ATC Service Cost</li> <li>• Enabler for Automation Upgrades (Partial Credit)</li> </ul>	<ul style="list-style-type: none"> <li>• Improved Safety</li> <li>• Improved Efficiency</li> <li>• Increased Capacity</li> <li>• Lower ATC Service Cost</li> <li>• Enabler for New ATM Operations (Partial Credit)</li> </ul>

# Other System Requirements

## (examples)

- Required Performance
  - Required Automation Performance
    - Human/Machine Interface
    - ADLS/Automation Integration
  - Required Navigation Performance
  - Required Surveillance Performance
- Communications Infrastructure
- Safety Case
- Security
- Performance Evaluation/Monitoring

# ADLS Applications (potential)

ADLS ROAD MAP - APPLICATIONS			
<b>Aircraft Operator</b>			
<i>Oceanic</i>	FANS-1/A	ATN Baseline 1	ATN Next Generation
<i>En Route</i>	POA FANS-1/A	ATN Baseline 1	ATN Next Generation
<i>Terminal</i>	FANS-1/A	ATN Baseline 1	ATN Next Generation
<i>Tower/Surface</i>	PDC/D-ATIS	ATN Baseline 1	ATN Next Generation
<i>Oceanic</i>	FANS-1/A	(GW)	ATN Next Generation
<i>En Route</i>	(GW)	ATN Baseline 1	ATN Next Generation
<i>Terminal</i>	(GW)	ATN Baseline 1	ATN Next Generation
<i>Tower/Surface</i>	PDC/D-ATIS	ATN Baseline 1 or (GW)	ATN Next Generation
<b>FAA</b>			
(GW) = via Gateway w/FAA System or Multi-Stack in FAA System			

# ADLS Networks and Subnetworks (potential)

ADLS ROAD MAP – NETWORKS/SUBNETWORKS

PDC/D-ATIS	ACARS/VDLMA	ACARS/VDLM2	IP-capable Broadband (GW)
Other POA	ACARS/VDLMA (GW)	ACARS/VDLM2 (GW)	IP-capable Broadband (GW)
FANS-1/A (Oceanic)	ACARS/SATCOM Data 2 ACARS/HFDL		IP-capable Broadband (GW)
FANS-1/A (Domestic)	ACARS/VDLMA (GW)	ACARS/VDLM2 (GW)	IP-capable Broadband (GW)
ATN Baseline 1 (Oceanic)		ATN/SATCOM Data 3 (GW)	IP-capable Broadband (GW)
ATN Baseline 1 (Domestic)		ATN/VDLM2	IP-capable Broadband (GW)
ATN Next Generation		ATN/VDLM2 ATN/SATCOM Data 3	IP-capable Broadband (GW)

(GW) = via Gateway w/FAA System  
or Multi-Stack in FAA System

# Conclusions

- ADLS is a key component of the “future NAS”
- ADLS implementation demands long term commitments by government and industry stakeholders
- ADLS is not currently a significant FAA budget priority
- We need to develop a low level, value-oriented ADLS implementation strategy NOW
- We need a government/industry-endorsed ADLS Road Map
- We need a clear definition of RCP, as a component of Required System Performance

# Questions?

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